

REMARKS

The Office Action dated October 23, 2006 has been received and carefully noted. The above amendments to the drawings and claims and the following remarks, are submitted as a full and complete response thereto.

Fig. 5 is amended to clarify the subject matter thereof. Claims 2, 4-10, 12, 15-17, 19, 21-23, 26, 27, 30, 31, 33, and 34, are amended to more particularly point out and distinctly claim the subject matter of the present invention. Claims 20, 28, 29, and 32 are cancelled without prejudice or disclaimer. No new matter is added. Claims 2, 4-13 and 15-19, 21-27, 30, 31, 33 and 34 are respectfully submitted for consideration.

The Office Action objected to the drawings because Fig. 5 fails to show that the first and second receiving units are the same entity. Applicants respectfully submit that Fig. 5 is amended to clarify each of the elements therein. Accordingly, withdrawal of the objection to the drawings is respectfully requested.

The Office Action rejected claim 34 under 35 U.S.C. 101 for being directed to non-statutory subject matter. Applicants respectfully submit that claim 34 is amended to be more clearly directed to a computer program in accordance with US Patent Practice. Accordingly, because claim 34 is directed to statutory subject matter, withdrawal of the rejection of claim 34 under 35 U.S.C. 101 is respectfully requested.

The Office Action rejected claims 15 and 26-34 under 35 U.S.C. 112, first paragraph, as not being enabling. The rejection of claims 28, 29 and 32 is moot in light of the cancellation of these claims with respect to claims 15, 26, 27, 30, 31, 33, and 34.

The Office Action asserted that the specification mentions that the first and second receiving units can be at the same location at the same time. Applicants respectfully submit that as clearly described on page 14, example 3 and page 15 lines 2 and 3, a mobile station can perform as both the first and second receiving units by taking a measurement at a first location, moving and taking a measurement at a second location. Neither the specification nor the current claims, recite that the mobile unit is at two places at the same time. Applicants respectfully submit that claims 15, 26, 27, 30, 31, 33, and 34 are amended to better clarify the above. As such, claims 15, 26, 27, 30, 31, 33, and 34 are fully enabled and supported such that one skilled in the art can make and/or use the present invention. Accordingly, withdrawal of the rejection under 35 U.S.C. 112, first paragraph of claims 15, 26, 27, 30, 31, 33, and 34 is respectfully requested.

The Office Action rejected claims 17, 19 and 20 under 35 U.S.C. 112, first paragraph for failing to comply with the written description requirement. Specifically, the Office Action asserted that these claims recite features that are not described in the specification. The rejection of claim 20 is moot in light of the cancellation of this claim.

Regarding claim 17, Applicants respectfully submit that this claim is amended to more clearly recite that the mobile station is a mobile phone. Support for this claim is found at least on page 14 example 3 of the specification.

Regarding claim 19, Applicants respectfully submit that this claim is amended to more clearly recite that the base stations are cellular base stations. Support for this amendment is found at least on page 9 lines 5-7 of the specification.

Based at least on the above, Applicants respectfully submit that each of claims 17 and 19 recite features that are fully supported in the specification. Accordingly, withdrawal of this rejection under 35 U.S.C. 112, first paragraph is respectfully requested.

The Office Action rejected claims 15 and 26-34 under 35 U.S.C. 112, second paragraph for being indefinite. The rejection of claims 28, 29 and 32 is moot in light of the cancellation of these claims.

With respect to the remaining claims, the Office Action asserted that there is a lack of proper antecedent basis for the first and second receivers. Applicants respectfully submit that claims 15, 26, 27, 30, 31, 33 and 34 are amended to more particularly point out that there is a single mobile station. Accordingly, withdrawal of the rejection under 35 U.S.C. 112, second paragraph is respectfully requested.

The Office Action rejected claims 2, 4-13, 15, 16, 19-24, 26 and 28-34 under 35 U.S.C. 103(a) as being obvious over US Patent No. 4,799,062 to Sanderford, Jr. et al. (Sanderford), in view of US Patent No. 4,665,404 to Christy et al. (Christy). The Office Action took the position that Sanderford disclosed all of the features of these claims except that the first and second receivers are the same entity. The Office Action asserted that Christy disclosed this feature. Applicants respectfully submit that the cited references, taken individually or in combination, fail to disclose or suggest all of the features recited in any of the pending claims.

The rejection of claims 20, 28, 29 and 32 are moot in light of the cancellation of these claims.

Claim 15, from which claims 2, 4-13, 16-19 and 21-25 depend, is directed to a telecommunications system. A first base station unit is situated at a first, known location. A second base station unit is situated at a second, unknown location. A mobile station is arranged to receive signals at a third, known location from the first and second transmitter unit. Once the mobile station has moved, the mobile station receives signals at a fourth known location from the first and second base stations, wherein the signals received at the third and fourth locations are usable to ascertain the location of the second base station.

Claim 26 is directed to a telecommunications system. A first base station is situated at a first, known location. A second base station is situated at a second, unknown location. A mobile station is arranged to receive signals at a third, known location from the first and second transmitter unit. Once the mobile station has moved, the mobile station is arranged to receive signals at a fourth known location from the first and second base stations. The signals received at the third and fourth locations are usable to ascertain the location of the second base station. A calculation unit is arranged to use the signals received at the third and fourth locations or any values derived from the signals, to ascertain the location of the second base station. The calculation unit is arranged to verify the accuracy of the ascertained location of the second base station by comparing it with location information of the second base station obtained from other sources.

Claim 30 is directed to a method of determining the location of a base station in a telecommunications system. Signals are received at a mobile station situated at a first, known location from a first base station situated at a second, known location. Signals are received from a second base station situated at a third, unknown location. The time difference is determined between the arrival times of a signal from the first base station and a signal from the second base station. Signals are received at the mobile station situated at a fourth, known location from the first base station and from the second base station and determining the time difference between the arrival times of a signal from the first base station and a signal from the second base station. The determined time differences are used to ascertain the location of the second base station.

Claim 31 is directed to a method of determining the location of a base station in a telecommunications system. Signals are received at a mobile station situated at a first, known location, from a first base station situated at a second, known location. Signals are also received from a second base station situated at a third, fixed, unknown location. The time difference is determined between the arrival times of a signal from the first base station and a signal from the second base station. Signals are received at the mobile station situated at a fourth, known location from the first base station and from the second base station. The time difference is determined between the arrival times of a signal from the first base station and a signal from the second base station. The time differences are used to ascertain the location of the second base station.

Claim 33 is directed to a calculation unit for use in a telecommunications system. A first base station is situated at a first, known location. A second base station is situated at a second, unknown location. A mobile station is arranged to receive signals at a third known location from the first and second base stations. The mobile station is further arranged to determine the time difference between the arrival times of a signal from the first base station and a signal from the second base station. Once the mobile station has moved, it is arranged to receive signals at a fourth, known location from the first and second base stations, and further arranged to determine the time difference between the arrival time of a signal from the first base station and a signal from the second base station. The calculation unit is arranged to use the time differences between the arrival times of signals from the first and second base stations as determined at the third and fourth locations to ascertain the location of the second base station.

Claim 34 is directed to a computer program for use in a telecommunications system. A first base station is situated at a first, known location. A second base station is situated at a second, unknown location. A mobile station is arranged to receive signals at a third, known location from the first and second base stations; and further arranged to determine the time difference between the arrival times of a signal from the first base station and a signal from the second base station. The mobile station is arranged to receive signals at a fourth, known location from the first and second base stations. The mobile station is further arranged to determine the time difference between the arrival time of a signal from the first base station and a signal from the second base station. The

computer program is configured to use the time differences between the arrival times of signals from the first and second base stations as determined at the third and fourth locations to ascertain the location of the second base station.

According to exemplary embodiments the present invention, the position of a base station to be measured is determined using a reduced amount of equipment. Furthermore, the use of only a single mobile station allows the measurements to be more uniform and therefore the accuracy of the position estimate to be improved. That is, if different mobiles were used to take measurements at different locations then the quality of those measurements could vary depending the particular mobile being used at each location. That would have an adverse effect on the estimate of the base station's location. By using a single mobile station, the present invention can eliminate this effect. Applicants respectfully submit that each of the pending claims recite features that are neither disclosed nor suggested in any of the cited references.

Sanderford is directed to radio position determination including an unknown position transmitter for transmitting a radio wave having compensation for multipath. A plurality of base repeaters having a synchronized pulse for time reference, receives the radio wave emitted by the unknown position transmitter and determines the relative times-of-arrival of the radio wave with respect to the synchronized pulse. A central monitoring station is coupled to the base repeaters for computing from the locations of the base repeaters and from the measured times-of-arrival, a coarse-position fix of the unknown-position transmitter. The system may include a mobile reference transceiver

located within the coarse-position fix, for transmitting a reference signal, wherein the central monitoring station generates a differential position from the reference signal and the radio wave for guiding the mobile reference transceiver to the unknown position transmitter.

Christy is directed to transmitting a spread spectrum signal from each of a plurality of base stations. The spread spectrum signal has a predetermined timing and has a ground wave component and a sky wave component. The signal is transmitted with a repetition time at least as great as a maximum anticipated delay time of the sky wave component such that the ground wave component of the transmitted spread spectrum signal can be distinguished from the sky wave component. The signal is detected at each of a plurality of mobile stations and the timing of the detected signal is compared to a local timing signal. The phase difference between these signals is indicative of the range of the base station from the mobile station.

Applicants respectfully submit that the cited references fail to disclose or suggest at least the feature of a mobile station that is arranged to receive signals at a third, known location from the first and second transmitter unit, once the mobile station has moved, the mobile station receives signals at a fourth known location from the first and second base stations, wherein the said signal received at the third and fourth locations are usable to ascertain the location of the second base station, as recited in claim 15 and similarly recited in claims 26, 30, 31, 33 and 34.

Sanderford merely describes that a central monitoring station 115 uses the differential position vector from the unknown position transmitter 106 to guide the mobile reference transmitter 108 to the unknown position transmitter 106. However, Sanderford does not disclose or suggest that the mobile reference transmitter 108 receives a signal from a first base repeater 110, and a second signal from another base repeater 110 after the mobile reference transmitter 108 has moved, and using the signals to ascertain the position of another base repeater 110.

Further, Christy fails to disclose that the first and second receiving units are the same entity such that a single mobile station acts as a both a first and a second receiving unit by receiving signals at one location, moving, and then receiving signals at a second location. The Office Action referred to column 10, lines 49-64 of Christy. However, Christy merely using two different ships 106 and 108 each with a plurality of receivers describes using boats 106 and 108 which each contain three receivers 160. There is a receiver for each of three base stations 100, 102 and 104. The receivers 160 merely generate the PN codes of the base stations and are not used to ascertain the position of any of the base stations. Thus, Applicants respectfully submit that neither Sanderford nor Christy disclose or suggest the need to measure the position of a base station, let alone the need to do so with a reduced amount of equipment or an improved uniformity of measurements.

Further, Applicants respectfully submit that one skilled in the art would not be motivated to combine the teachings of Sanderford and Christy as suggested in the Office

Action. There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998). The Office Action asserted that it would be obvious to make the combination “for the benefit of achieving a system that can simultaneously produce positioning data for a plurality of stations relative to the position of known base stations”, which is a stated objective of Christy’s at column 2, lines 25. However, there is no suggestion in Christy that the ability to simultaneously produce positioning data for a plurality of stations is particularly linked to the cited feature described at column 10, lines 49-64 of Christy. Therefore, this objective does not provide any motivation to select this particular feature from Christy and introduce it into Sanderford.

Further, Sanderford already has the ability to simultaneously determine the positions of a plurality of mobile stations (see column 10, lines 59-60 of Sanderford). Therefore, the alleged rationale upon which the Office Action has relied, provides no motivation to modify Sanderford with the teachings of Christy.

Applicants respectfully submit that because claims 2, 4-13, 16, 19 and 21-24 depend from claim 15, these claims are allowable at least for the same reasons as claim 15, as well as for the additional features recited in these dependent claims.

Based at least on the above, Applicants respectfully submit that the cited references fail to disclose or suggest all of the features recited in claims 2, 4-13, 15, 16, 19, 21-24, 26 and 30, 31, 33 and 34. Accordingly, withdrawal of the rejection under 35

U.S.C. 103(a) of claims 2, 4-13, 15, 16, 19, 21-24, 26 and 30, 31, 33 and 34 is respectfully requested.

The Office Action rejected claims 17, 18 and 25 under 35 U.S.C. 103(a) as being obvious over Sanderford and Christy, in further view of US Patent No. 6,611,788 to Husa.

Applicants respectfully submit that the present application was filed in July 2, 2004 and is owned by Nokia Corporation. Husa is also owned by Nokia Corporation was filed on May 17, 2000 and issued on August 26, 2003. Thus, Husa qualifies as prior art only under 35 U.S.C. 102(e). Therefore, under 35 U.S.C. 103(c) Husa does not qualify as a prior art reference under 35 U.S.C. 103(a). Withdrawal of the rejection under 35 U.S.C. 103(a) of claims 17, 18 and 25 is respectfully requested.

The Office Action rejected claim 27 under 35 U.S.C. 103(a) as being obvious over Sanderford and Christy, in further view of US Patent No. "134,488" to Shoji (Shoji).

Applicants respectfully submit that US Patent No. 134,488 is to H.R. Underhill and is directed to horseshoe nails, which is not analogous art. US Patent No. 6,134,488, however, to Shoji is directed to detecting positional information. In the event that this application is not in condition for allowance, Applicants request a new non-final Office Action to clarify this discrepancy. The Office Action took the position that Sanderford and Christy disclosed all of the features of these claims except that wherein the ascertained location of the second transmitter unit is usable to check the accuracy of identification information of the second transmitter unit obtained from other sources and

thus identify the second transmitter. The Office Action asserted that “Shoji” disclosed this feature. Applicants respectfully submit that the cited references, taken individually or in combination, fail to disclose or suggest all of the features of claim 27.

Claim 27 is directed to a telecommunications system. A first base station is situated at a first, known location. A second base station is situated at a second, unknown location. A mobile station is arranged to receive signals at a third, known location from the first and second transmitter unit. Once the mobile station has moved, the mobile station receives signals at a fourth known location from the first and second base stations. The signals received at the third and fourth locations are usable to ascertain the location of the second base station. The ascertained location of the second base station is usable to check the accuracy of identification information of the second base station obtained from other sources and thus identify the second base station.

Sanderford and Christy are discussed above. “Shoji” is directed to a mobile terminal in a mobile communication system of a small-zone system. The mobile terminal 1 transmits base station identification information transmitted from base stations 2a through 2d and information of the intensity of electric field of received radio wave from the base station to a position managing station, while the position managing station specifies the current position of the mobile terminal, based on the above-mentioned information by means of a relational expression of the intensity of electric field and a distance between a point of transmission and reception and a database of the base station. With the simple construction of the mobile terminal 1, the current position of the mobile

terminal 1 can be specified with higher accuracy. Further, the mobile terminal 1 transmits the base station identification information of the plurality of base stations and the intensity of electric field of the received radio wave from the base station to the position managing station, the current position of the mobile terminal 1 can be specified with higher accuracy.

Applicants respectfully submit that the cited references fail to disclose or suggest the features of once the mobile station has moved, the mobile station receives signals at a fourth known location from the first and second base stations and the signals received at the third and fourth locations are usable to ascertain the location of the second base station, as recited in claim 27.

Specifically, Sanderford and Christy are deficient at least for the reasons discussed above regarding claims 15, 26, 30, 31, 33 and 34, and “Shoji” fails to cure these deficiencies. As discussed above, “Shoji” merely describes determining the position of the mobile terminal and not a base station. See the Abstract and column 2 lines 61-65 of “Shoji”.

Based at least on the above, Applicants respectfully submit the cited references fail to disclose or suggest all of the features of claim 27. Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

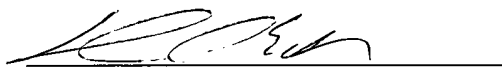
Applicants respectfully submit that each of claims 2, 4-13 and 15-19, 21-27, 30, 31, 33 and 34 recite features that are neither disclosed nor suggested in any of the cited

references. Accordingly, it is respectfully requested that each of claims 2, 4-13 and 15-19, 21-27, 30, 31, 33 and 34 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosure: Replacement Drawing (1 sheet – Fig. 5)

AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings includes changes to Fig. 5. The attached sheet replaces the original drawing sheet for Fig. 5.